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ALL TERRAIN VEHICLE USER PREFERENCES  
FOR THE WEST SLOPE FORESTS OF THE CENTRAL OREGON CASCADES

By

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# ABSTRACT

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**Title:** All Terrain Vehicle User Preferences For the West Slope Forests of the Central Oregon Cascades

**Abstract:** All terrain vehicles are becoming the primary off road vehicle used on public lands in Oregon. This report documents an inquiry into user preferences for recreation activities, settings, and facilities in the west slope forests of the central Oregon Cascade mountains. Twenty persons, including users, dealers, industry representatives, user group leaders and resource managers were asked 31 questions relating to probable user preferences for play areas, trails, and base facilities. Responses show that the majority of ATV users likely to use forest lands have preferences and habits similar to off road vehicle users studied elsewhere. They are quite socially oriented and seek challenge, but are generally noncompetitive. They prefer trail riding over play area riding or riding roads. They prefer viewing natural settings but will accept trails in harvested forest. Other preferences were identified as well.

The author concludes that user preferences for activities and settings converge with USDA Forest Service policies on provision of opportunities. The roaded natural physical ROS setting and rural social and managerial settings are appropriate. Forest lands within 1 1/2 hours driving time from major population centers should be inventoried for trail potential but not for play area potential. Existing hiker trails should not be converted to ATV trails. Trail designs should be reviewed for capability to withstand motorcycle use. Minimum trail lengths of three miles (easier rating) to 10 miles (more difficult) are necessary. Multiple opportunities should be offered in any trail system design. Development should not occur unless length and adequate challenge can be assured. Additional recommendations are made.

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## EXECUTIVE SUMMARY

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All terrain vehicle numbers have increased greatly in Oregon. The number of hours of off road vehicle operation has increased substantially in the past five years primarily due to all terrain vehicle use growth. Available recreation use opportunities near urban areas are limited; more are needed. Information on user preferences is vital to making decisions about providing for use. This report summarizes existing literature on the characteristics of off road vehicle users and all terrain vehicles. It also reviews the literature of management techniques. The body of literature has little specific applicability to the heavily forested western slopes of the central Oregon Cascade mountains. It is greatly lacking in discussion of the all terrain vehicle although it may be relevant to the all terrain vehicle user.

Twenty persons, including users, user group leaders, industry representatives, dealers, and resource managers, were interviewed for this study. They were asked 31 questions intended to disclose preferences of the majority of all terrain vehicle users for activities, settings, and facilities potentially available in the west slope Cascade forests. Responses suggest the following. Users have a strong preference for trail riding as opposed to play in open areas. They prefer to ride with others rather than alone. They prefer to ride to relax, to tour, and to view scenery rather than for physical challenge alone and they prefer to ride to challenge themselves rather than to compete with other riders. They prefer multipurpose trails over challenge trails.

They prefer rides of from one to two hours to a half day in duration. They prefer trails from which horse users and hikers are excluded. They do not want to ride on gravel roads; they prefer trails to unsurfaced roads. They prefer natural appearing settings over viewing harvested forest areas. They prefer user controls imposed by the manager.

Where overnight facilities are planned, users prefer facilities with modern conveniences and prefer to pay for added services. Users are split on the need for picnic facilities versus staging facilities alone. Most prefer to have a loading ramp available.

The author concludes that user preferences for activities and settings converge with USDA Forest Service policies. The roaded natural physical ROS setting and rural social and managerial settings would meet the expectations of potential users.

The author recommends that forest lands within 1 1/2 hours driving time from major population centers be inventoried for potential to provide nonsnow season all terrain use opportunities. Where appropriate, trail systems should be constructed to provide multiple loops of three to ten mile rides with "easier" and "more difficult" classification respectively. Trails should be built which provide varied experiences as opposed to trails designed exclusively for challenge. Trails should be located in relatively natural appearing areas but harvest areas may be acceptable to users. A high level of group interaction is acceptable both on trails and in base facilities.

Existing hiker trails should not be converted to ATV trails due to the likelihood of user conflicts. Motorcyclists will most likely use the trails but will find much less challenge in the alignment. Trail designs should be reviewed for capability to confine and withstand motorcycle use. Development should not occur unless trail length is sufficient to provide at least a half day ride and adequate challenge can be assured to hold rider interest. Area development should be based upon an approved management plan. State of Oregon all terrain vehicle fund grants should be sought for both development and maintenance.

## ACKNOWLEDGEMENTS

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## CHAPTER ONE

### INTRODUCTION

Every generation of resource manager has, at some point, been stopped short by the discovery that the status quo has been upset. The chain saw, the seismic line, the radio collar, and the motor home have all, in their turn, added another factor to the management equation. Time and again the resource manager has had to reexamine commitments to an ever multiplying variety of users in the attempt to serve "the greatest good for the greatest number in the long run."

Today the all-terrain vehicle user enters the scene, seeking to exercise his right of access to the public land. Is there a place for all terrain vehicles in the National Forest? Are they needed? Are they compatible with big game, plantations, and anadromous fish? Should trails be built, snow be groomed, hikers be displaced, and scarce funds be divided one additional way?

Before these management questions can be answered, basic information about all terrain vehicle use and user preferences for activities, facilities and resources is needed.

Legislation passed in 1984 by the State of Oregon established a permanent fund for development of all terrain vehicle facilities in Oregon by drawing from gas tax collections and vehicle registration fees. The fund, administered by the Department of Transportation, makes funds available for use by municipal, county, state, and federal agencies. They are allocated through the efforts of an advisory committee made up of representatives of user groups and concerned



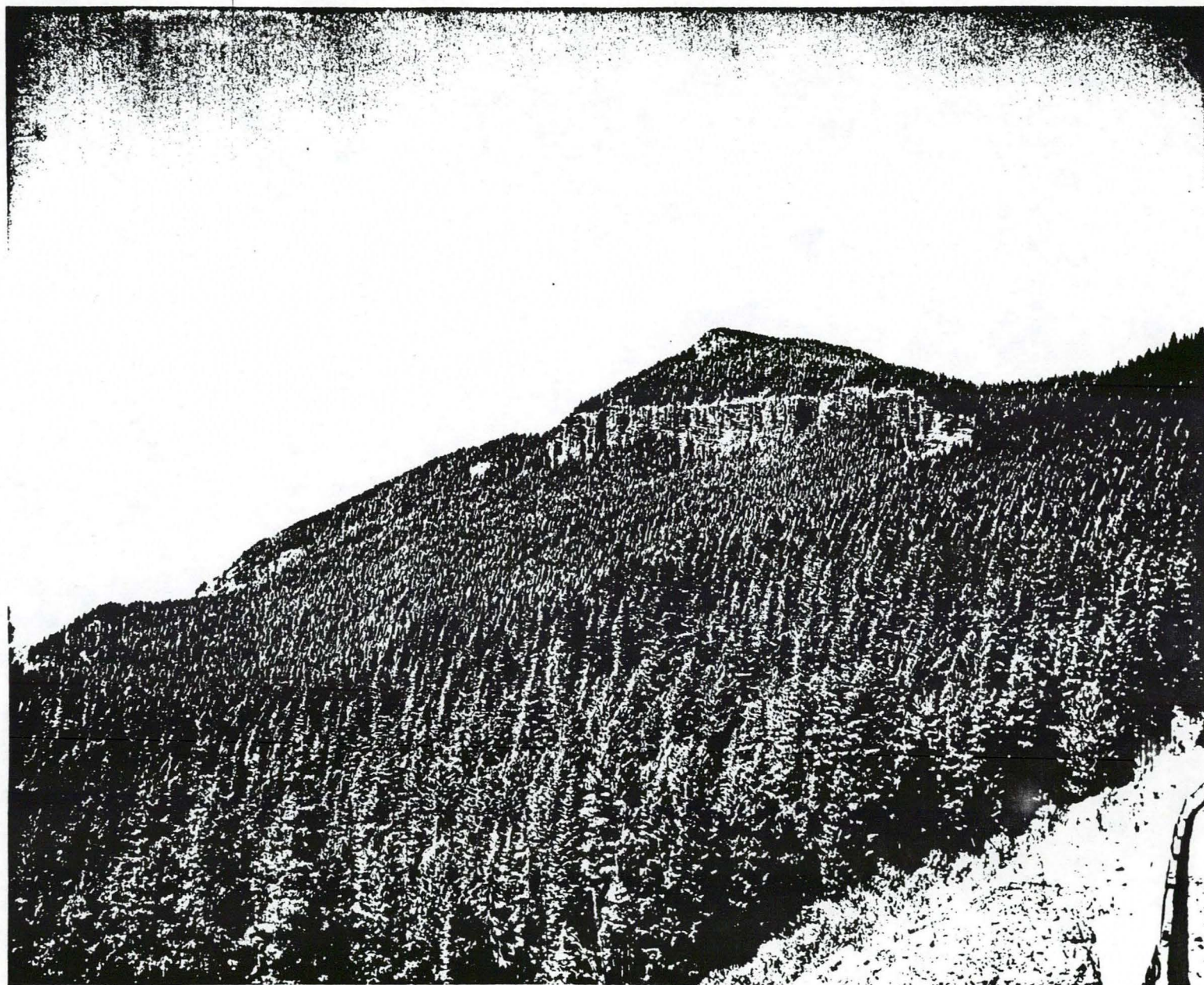
agencies, including the U.S. Forest Service. The fund has grown substantially in the three years since its creation. Allocations for facility development have only begun to match additions to the fund, although government entities at all levels have begun to submit proposals or to initiate planning for management of all terrain vehicles. Given the growth rate of the fund, agencies are recognizing a means to provide recreation opportunities that was heretofore nonexistent. A predictable outcome of this situation is one in which facilities are developed, in turn generating additional user interest and expanding participation in all terrain vehicle use. Whether or not Willamette National Forest resource managers anticipate this trend, Forest resources are likely to become part of the equation, given their close proximity to the major population centers of the state. Entering the situation with a base of knowledge is vital for managers, regardless of what accomodation of the user is planned.

#### Management Setting

Elevations in the subject area range between 900 and 4,000 feet. The area is almost completely forested with coniferous trees with light to dense ground cover underneath. Terrain is steeply dissected and perennial streams are frequent. Soils are typically friable and infertile. Both anadromous and resident fisheries occur. Rainfall ranges between 40" and 90" with the heavier precipitation occurring as rain and snow at the upper elevations during the winter and spring . Most of the available terrain lies at middle elevations with the higher country designated as wilderness and inaccessible by regulation.













## Statement of Purpose

This project is being undertaken to give the resource managers of the Willamette National Forest added insights into the nature of all terrain vehicle use and users. In this report information is provided about all terrain vehicle use trends and user preferences. Also discussed are the kinds of facilities and resources that satisfy user needs. Recommendations are made as to a useful course of action to provide opportunities for management.

### Assumptions

A basic assumption of this project is that all terrain vehicle use is a valid and acceptable use of Willamette National Forest lands. The author believes that all terrain vehicle use can occur without unacceptable resource damage or conflict with other users. For this reason, the issues of environmental impacts and user conflicts will not be discussed in this report. They will be left for consideration by resource managers in the process of making land use decisions.

A second assumption is that a reasonable portrayal of user preferences and needs can be made possible through inquiries with user group leaders, industry representatives, dealers, and resource managers.

A third assumption is that all terrain vehicle use and the availability of facility development funds will continue to be substantial in the foreseeable future.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

The literature of all terrain vehicle management is very limited. Little has been written that deals specifically with the all terrain vehicle or its user. Motorcycles, snowmobiles and four wheel drive vehicles have all been closely examined along with the implications of their use. Perhaps because of its assumed similarity and that of its users, the all terrain vehicle has been largely ignored as a separate phenomenon. We are, for the most part, left to review research conducted on the management of other off road vehicles to draw meaningful inferences about all terrain vehicle use and management.

Discussion here will center on four topics: agency philosophy, techniques for off road vehicle management, vehicle characteristics, and user characteristics.

#### U.S. Forest Service Philosophy

Tom Lennon (1984), Trails, Rivers and Off Road Vehicle Specialist on the USDA Forest Service's Washington Office staff, has described the Forest Service role in providing for all terrain vehicle use:

For some time now, we have recognized that the large land base found within the National Forest System provides some unique recreation opportunities. We have developed those opportunities in ways that have now become traditional. We believe our traditional role of providing recreation opportunities in rural to primitive settings with an emphasis upon activities that are in harmony with the natural environment represents the correct niche for the Forest Service. In filling this niche, we have decided not to provide a number of recreational activities because they do not meet our role criteria.



Competitive events such as motocrosses and hill climbs are examples of activities that are not acceptable. They represent competition against the environment rather than harmony with nature and tend to be destructive to the National Forest.

...While we have specific trail guides for all terrain vehicles, it does not necessarily follow that the Forest Service will have a program to develop trails for the exclusive use of all terrain vehicles. The more likely course is that all terrain vehicle use will be accommodated on 4x4 ways and trails established for other purposes. This is typical of most of our trails. In other words, the trail systems are designed to accommodate a variety of users.

He goes on to cite the Forest Service Trails Handbook 2350 (1983):

...all terrain vehicle use should occur on trails and routes designated for other motorized uses which fit the all terrain vehicle trail guide specifications. These include bike and snowmobile trails and four-wheel drive ways. These trails and ways provide a variety of experiences with emphasis upon bringing the users into concert with the natural setting.

...Include frequent elevation changes and turns appropriate for each skill level. These features slow the operator, increasing safety and providing more riding time per mile of trail.

#### Management Techniques

Issues surrounding the use of off road vehicles generated many studies, symposia, conferences, and publications in the 70's. The off road vehicle had sprung from the industrial womb full grown. Resource managers were ill prepared and the literature reflects the hand wringing that ensued. Wildlife displacement, vegetation loss, soil erosion, and the effects of noise pollution were examined in great detail (Chilman, 1973). Dialogue between opposing factions and managers as to the validity of off road vehicle use on public lands is recorded (Andrews and Nowak, 1980). Notably absent is any great attention to the development of management systems. This is understandable. Where issues existed, off road vehicle use was already in place and managers were in the reactive mode. The opportunity to plan and initiate was past. In the words of



Russell Shay (1978), "Off road vehicle users [did] much of the decisionmaking, and managers [came] along after and [tried] to clean up." He goes on to say:

The U.S. Forest Service manages 188 million acres of public lands for which off road vehicle management planning was directed by Executive Order 11644 (Nixon, 1972). A memo from Forest Service headquarters to all Regional Foresters (Smith, 1976) advised the following policy toward off road vehicle planning:

Restrictions and closures are to be used only as a last resort...Restrictions will be based on...adverse effects to resources/the environment (damage must be occurring or be in immediate danger of occurring). The inclusion of large acreage in closures or restrictions to a localized problem is not accepted.

These instructions clearly weigh against even the most rudimentary types of prophylactic management. Managers are instructed to forego the precaution of planning for areas where off road vehicle use is not already established and apparent. Management is restricted to following existing off road vehicle routes looking for problems.

The intent of these directions is to minimize the management presence, in keeping with generally accepted wildland recreation objectives but, in actual practice, they represent a short-sighted strategy toward that end. When managers follow off road vehicle trails looking for problems, they end up closing areas with established use. No matter how small a percentage of the total management area these closures represent, they are very evident to off road vehicle users. (p. 315)

In discussing restrictions concerning off road vehicle user behavior, Holecek (1978) points out that "...recreationists will react favorably to management allocation of scarce resources to improve quality once they become aware of the benefits they will receive, but controls will, in most cases, meet strong initial resistance from users who see only the negative aspect, i.e., a reduction in their freedom of access."

Shay (1978) suggests an alternative to blanket regulatory restriction of users:

A logical way to minimize the need for response-management is through positive planning efforts based on resource information---particularly on soils, slope and vegetation data---by zoning off road vehicle use to reduce potential problems (Geological Society of America, 1977). A more positive management approach might also make solutions other than closure more acceptable where problems occur in areas zoned for off road vehicle use. A number of techniques for trail-hardening, for example, have been demonstrated on a limited basis (Rasor, 1977), but their use requires a

commitment to active rather than passive off road vehicle management. (p. 316)

Garrelle Nicholes (1980) comments that "off road vehicles can be specifically designed for many uses, such as play activity, pseudo competition, structured competition, and recreational trail riding. The most common definition of off road vehicle use implies only unstructured use of the equipment following no pathway on a resource. Knowledgeable viewers of the sport would expand the definition to acknowledge a substantial additional activity---that of using a lineal corridor, such as an unpaved, a graded or an ungraded road, or a single wheel or similar pathway from Point A to Point B."

Applicability of existing literature. Much of the portion of off road vehicle literature dealing with user activities and preferences does not apply well to the planning environment of the Western Oregon Cascades forest. With few exceptions, in existing discussions off road vehicle use is assumed to be preexisting, occurring unconfined over relatively large areas as a cross country activity. While this assumption applies well to the open forest land of parts of California, the Rocky Mountain states and the Southwestern desert, it is much less applicable to much of the west slope of the Oregon Cascades. Here the vegetative barriers of the closed canopy Douglas-fir forest are much more formidable. With the added limitations of steep terrain and the relative lack of unsurfaced long distance roads and wide trail corridors, a materially different picture is presented. True off road use by all terrain vehicles does not occur except as over-snow travel or in that small part of the Cascade crest that has not been included within wilderness.

In fact, with the exception of one area already allocated to off road vehicle use, the Willamette National Forest resource manager has the unique and enviable



opportunity to plan for use at its inception. This is in contrast to planning for off road vehicle use in a reactive mode, where use is preexisting and unconfined and the objective is to resolve problems of resource impacts and user conflict.

### Vehicle Characteristics

The all terrain vehicle is both similar to and unlike other off road vehicles. Its unique combination of small size, three and four wheel construction and high flotation make for distinctly different operating characteristics and facility requirements. These features may also attract a somewhat different user than the larger, more expensive four wheel drive vehicles and snowmobiles or the potentially more athletically demanding motorcycles.

At the same time, the more basic commonalities of speed, mechanical operation and social interaction as attractants apply to the all terrain vehicle much as they do to other off road vehicles.

In 1987, five corporations manufactured all terrain vehicles: Honda, Kawasaki, Yamaha, Polaris, and Suzuki. Of these, four marketed three wheel vehicles and one marketed only four wheel vehicles. See Table One for vehicle specifications.

All terrain vehicle specifications continue to evolve after 17 years of production. In 1983 all terrain vehicles were made up of three wheel models primarily with some four wheel models beginning to gain popularity (Crimmins, 1984). In 1987, the U.S. Consumer Protection Agency proposed the recall of all three wheeled youth models due to an allegedly high rate of injuries sustained

by riders and the industry began shifting away from three wheel model production. In 1983 most models had no suspension. In 1987 most had front wheel shock absorbers and many had rear wheel shock absorbers as well. In 1983 most models were under 40" in width, the limit used in U.S. Forest Service regulations to define trail vehicles. By 1987 60% were over 40" in width. Likewise, weight and engine displacement have increased (Kawasaki, 1986).



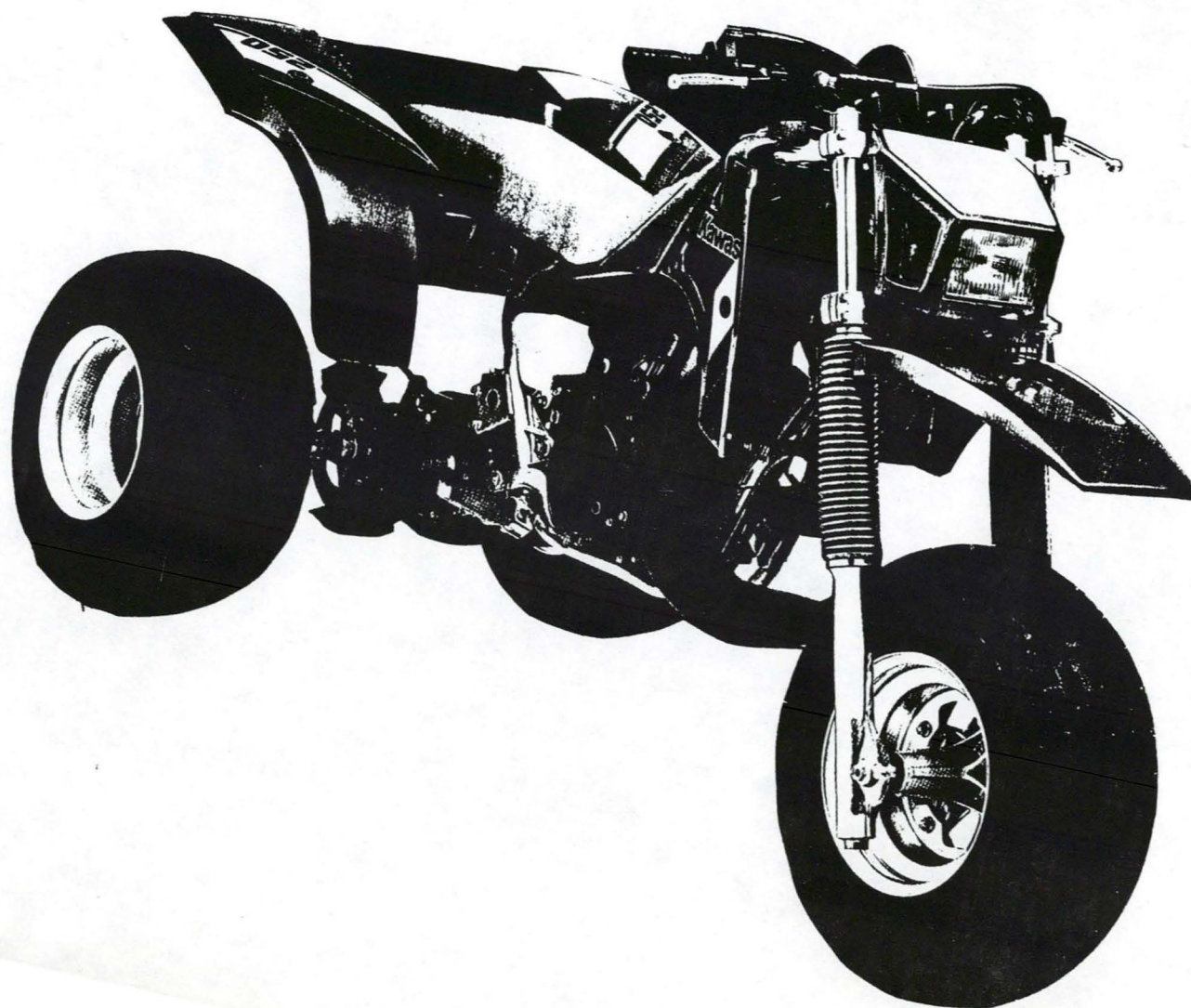






TABLE ONE

All Terrain Vehicle Specifications, 1986 Models<sup>1</sup>

MODEL	LENGTH	WIDTH	HEIGHT	WHEEL BASE	WEIGHT
<u>Honda</u>					
TXR250	73.8	42.5	40.2	48.6	478
TRX200SX	65.4	39.4	40.0	42.1	344
ATC250R	74.8	44.4	42.7	30.5	291
ATC200S	68.3	40.0	38.6	44.5	276
ATC125M	65.9	38.6	38.0	26.2	269
<u>Kawasaki</u>					
KFL300-A1	72.8	43.3	41.1	47.2	492
KFL185-A2	67.5	39.4	38.8	43.3	357
KXT250-B1	73.6	44.5	42.7	29.5	280
KLT185-A1	68.1	39.4	39.4	43.7	278
KLT110-A3	67.3	38.4	39.0	27.9	240
<u>Polaris</u>					
W877527	70.0	43.5	43.0	45.5	440
W877828	78.0	43.5	43.0	50.0	400
W878027	70.0	44.0	46.0	47.5	490
<u>Suzuki</u>					
LTF230G	73.0	39.4	42.1	45.5	450
LT185G	66.1	37.4	38.6	41.1	304
ALT125G	65.2	37.4	38.0	27.2	260
<u>Yamaha</u>					
YFM225S	73.2	43.9	39.6	46.6	452
YFM200DXS	68.9	41.1	40.0	44.1	374
YTZ250S	74.4	42.9	41.9	29.7	294

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Sources: Kawasaki: How We Stack Up (Quick Reference Guide), 1986. Kawasaki Motor Corporation, USA. Included 1986 model data for Kawasaki, Honda, Suzuki and Yamaha.

Larry's Power Sleds. Cottage Grove, Oregon. 1987 model data for Polaris.



All terrain vehicles have tires with inflation pressures that are extremely low, typically 2-6 pounds per square inch and nearly low enough to allow depression of the tire casing to the wheel by hand pressure alone. Despite the low inflation, rear wheels of many all terrain vehicles give enough buoyancy to prevent effective traction in deep water.

Many all terrain vehicles have centrifugal clutches, requiring no manual disengagement to shift. In the place of the manual clutch lever, a hand brake control may be found which duplicates the actions of the foot brake. A parking brake lock mechanism, which is often essential to maneuver out of a stall on steep terrain, is integral to this hand brake mechanism.

Most all terrain vehicles have "live" or solid rear axles: both rear wheels must spin at the same rate at all times. In order to turn efficiently, the rider must shift weight off the inner rear wheel, allowing it to slip. When both rear tires retain traction in a turn, they tend to force the vehicle straight ahead. Thus the rider must transfer his weight to the outside wheel to negotiate a turn. (At high speeds weight is shifted outward while the rider continues to lean inward to maintain the necessary center of gravity.)

The slippage of the all terrain vehicle's inner wheel during turns has the effect of shearing the soil at its surface. This ground surface shear produces both slip and soil thrust. The first impedes vehicular movement, the second effects it. Both are a necessary part of locomotion. While most vehicles are designed to operate at an optimum on the slip-thrust curve, all terrain vehicles are not. The effect is to generate a high degree of ground shear especially in turns but also in general operation. The result is a degree of soil disturbance and ensuing trail deterioration in the absence of armoring and other design

compensations (Bekker, 1980). While damaging to soils, this effect is said by many to be moderate relative to the effects of other forms of off road vehicles. Some all terrain vehicles have a manually locking differential which, assuming the rider were to use it, could counteract this effect although the majority are made with solid rear axles.

The tricycle configuration requires descent along the fall line on steep hills to prevent tipping over sideways. Weight distribution, likewise, makes backing down steep hills nearly impossible without tipping over backwards. The presence of two rear wheels immediately behind the feet increases the risk of driving over one's own foot (as the author can testify) if the rider reflexively puts a foot on the ground to gain stability. These characteristics make all terrain vehicle handling significantly different from that of other off road vehicles, especially motorcycles (Outdoor Empire Publishing, 1985) and have resulted in a relatively high number of operator injuries (Janson, personal communication).

## User Characteristics

Who is the all terrain user user? Knowing some characteristics of the all terrain vehicle user can give us insights into needs and expectations. Once again, however, we must depend upon demographics of other off road vehicle participants. The all terrain vehicle phenomenon is too new and, until recently, has been too small a part of the off road vehicle picture to have been scrutinized in the current literature.

### Demographics

In a 1982 reader survey of American Motorcyclist, the American Motorcyclist Association found that the typical off-road motorcycle rider (including riders of all terrain vehicles) was 29.7 years old, was male (91.3%), married (50.2%) and had ridden for 8.0 years. Of these, the average trail rider was 27 years of age, male (92.1%), unmarried (51.7%), had ridden for 11.6 years, and had a household income of \$20,000-\$35,000.

The AMA also found that recreational trail riding was the primary aim of 59.9% of those surveyed. Annually, 480 miles were ridden with 25% ridden in spring, 47% in summer, 17% in the fall, and 10% in the winter. Of this group, 81% percent of the all terrain vehicle users rode year around. Trail riders travelled an average 57.4 highway miles to their trailriding destination. According to the 1986 edition of Motorcycle Statistical Annual (Motorcycle Industry Council, 1986), 682,0000 all terrain vehicles were imported, compared with the total combined domestic production and importation of 862,000 on and off highway and dual purpose motorcycles. (The latter production/importation



figure includes domestic all terrain vehicle production in the total for motorcycles, in effect, adding even greater significance to the all terrain vehicle share of the total manufacture.)

Keir Nash (1980) points out four demographic characteristics of off road vehicle recreationists that are differentiating: sex (male), ethnic background (northwest European descent), residence (rural West), and age (late 20's median). He also points out six nondifferentiating characteristics which cause them to closely resemble a cross section of the American public: education, income, employment status, marital status, political party affiliation, and political liberalism or conservatism. He states that [according to the evidence provided] "these similarities all go to sustain.....that off road vehicle users are 'average Americans'." Three other characteristics, social class, education, and occupation and group leadership are, by contrast, "arguably distinguishing attributes," he states. Again, research results are presented to support the position.

Keir Nash draws three sets of conclusions. Off road vehicle recreationists rank lower in educational attainment, i.e., completion of college. They are disproportionately weak in professional/business association membership and disproportionately strong in labor union membership. They are "lower" in terms of percentage employed in higher status, professional occupations.

Fillmore and Bury (1972) interviewed, 109 off road motorcycle riders at Land Between the Lakes National Recreation Area in Kentucky and Tennessee. They found that riders were 75-88% male, that 50% were under 20, and that 32% were under 16. They had a wide range of occupations which put them at the middle of

Duncan's Socio-Economic Scale. They viewed themselves as unintellectual, socially accepted, considerate, and highly motivated.

Card (1980) found, in self-concept tests of motorcyclists relative to nonusers (affiliates of the Sierra Club), that users held higher self-concepts overall. They were found to be more confident and determined and significantly more motivated. They had higher self-concepts in both emotional and physical dimensions. They had lower self-concepts in intellectual and self-in-relation-to-others dimensions.

In this connection, it is interesting to note the comments of Garrelle Nicholes (1980), who states that "motorized vehicle use is a dimensional extension of the individual that encompasses his physical performance. It rewards the participant for his skill and aptitude and he is further rewarded sociologically by his peers for his involvement. Lastly he gains his own personal psychological growth as he reacts successfully to both positive and negative aspects of the experience." (p. 12).

#### User Preferences, Attitudes, and Expectations

Peine (1972) queried 160 four wheel drive users of southwest desert land near Tucson, Arizona to learn about user preferences and use patterns. He found that 45% were involved in the activity with their families. Given the choices of preferred use patterns as vehicle oriented, activity oriented, or land oriented, 51% of users were activity oriented, primarily to the activity of "hunting". Of those oriented to vehicles, the large majority chose "challenging terrain" over "working on vehicles" or "comparing performance". Of those who were land oriented, the great majority preferred to "see countryside". Results varied



depending on whether respondents were users of manufactured or reconstructed vehicles. The mean number of trips taken per month was 2.05.

Peine interpreted the data as showing that "the average respondent [was] not an adventurous soul looking for new areas to explore and experience, but, rather, made repeated use of preferred areas." Oddly, the data also showed that respondents stated a preference for visiting new places.

Of all preferred activities, the top three included hunting, seeing the countryside, and driving over challenging terrain. The next five categories, in order, included camping, fishing, exploring, picnicking, and comparing performance.

Other important preferences included familiarity with the area being used, short travel time to area (short equated to 1 hour and 26 minutes for a one day trip), and sense of remoteness. Responses for the last category showed that areas chosen accounted for 49% of all use, thus indicating that the presence of other off road vehicle users did not diminish the feeling of remoteness.

High scenic appeal was also highly desirable for many users. Using rugged, challenging trails was important only to the vehicle oriented recreationist.

One conclusion reached by Peine is that "...the greatest value of off-road vehicle recreation is the exposure of the vehicle passengers to landscape which they could never experience from a sedan automobile or by foot, due to distance to travel or physical handicap. In talking to respondents, time and again I sensed the respect and fondness they felt for the natural landscape. If there is to be sincere interest in the natural environment, which is our American

heritage, people must first experience this environment for themselves, and only then will they learn genuinely to respect it." (Peine, p. 122)



## CHAPTER THREE

### STATEMENT OF METHODS

#### User Preference Interviews

In this study, twenty persons who were considered to be knowledgeable of the preferences of all terrain vehicle users of regional resources were interviewed personally and by telephone. Respondents were selected to represent a cross section of user groups. Area residents and nonresident users of local resources were included. Users with primarily political orientations were included as well as apparently nonpolitical enthusiasts. User group affiliates were chosen along with unaffiliated users. Dealers, industry representatives, and one national-level user advocate were selected. A local club leader, a state organization leader and a volunteer management support group leader participated. Three major use area managers, each at a different level or role in management, and others from different settings were interviewed.

The respondents were asked 31 questions intended to disclose preferences of the majority of all terrain vehicle users they knew for activities, settings, and facilities that might be available to them in forested lands on the western slope of the central Oregon Cascade Mountains (see Appendix for the instrument script). Respondents were instructed to limit their responses to a preference for one of two given alternatives. In addition, they were permitted to state a strong preference for one of the two given alternatives or to state neutrality on the choice of alternatives. Thus, a response could be one of five alternative choices for each of the 31 questions.

Respondents were allowed to ask questions at any time, but were instructed to withhold long comments until the series had been completed.

Respondents were asked to assume that the preferences were to apply to the snow free season of use on the west side of the central Oregon Cascade Mountains.

The questions were made up of an opening series of general questions followed by questions categorized as relating to play areas, trails, and facilities. These groupings were identified to the respondents as categories during questioning to clarify the intent of inquiry.

The question series was devised with a number of objectives in mind. Some questions were intended to give insights into activity preferences. Others related to social, physical, and managerial settings. Some were phrased so as to define needs for support facilities, although actual design terminology was, for the most part, excluded from the discussion.

References to activities and settings are related to the Recreation Opportunity Spectrum, a system for structuring the provision of resource-based recreation use opportunities on National Forest lands nationwide. The intent was to tie user preferences to this process for land management in order to provide National Forest managers with insights structured to fit a framework of concepts with which they are well acquainted.

Response choices were intended to force respondents to commit their thinking to a single alternative set of assumptions on preferences of their known user public. That is, once a respondent stated the majority of users he knew



preferred to tour, rather than compete, this judgment became fundamental to a series of responses which portrayed actions and attitudes that occurred during touring. The intent was to preclude vacillating responses which could meander in their reference between competition and non-competitive riding, playing and trail riding, activities inherent to other settings, and so on.

The opportunity to phrase a strongly felt position through a "strongly prefer" statement was intended to uncover situations which could suggest the likelihood of high user need, social or managerial conflict, and inordinate resource and facility pressures, as well as possible issues of political import.

In all cases, respondents were encouraged to amplify their responses with additional discussions. Considerable benefit was gained from this process and insights were shared which in some ways proved much more valuable to the author than the responses discussed in this report.

#### Use Trend Analysis

All terrain vehicle registration figures are compiled by county for the State of Oregon annually. They were aggregated on the basis of proximity to Forest resources for this study, although substantial use of the Oregon Dunes National Recreation Area is generated by nonlocal and out of state users and could likewise be so on the Willamette. Recreation use reports compiled by personnel at the Oregon Dunes were examined to reflect this single most significant set of opportunities in the region, although it represents a distinctly different kind of experience from that which is potentially available on the Forest. Additional use reports were sought for other areas of use in the vicinity but

were found to be either nonexistent or nonspecific to all terrain vehicle and motorcycle use. Use at out of state areas was felt to be irrelevant to the answers being sought in this study because it related to different user populations in different settings and could not be construed as reliably indicating situations that clearly compare to this one.



## CHAPTER FOUR

### DISCUSSION

#### User Preferences

Respondents stated a strong preference for trail riding (75%, 10% neutral). They indicated a weak preference (45%, 40% neutral) for riding to relax over riding for a challenge and they were unanimous in their statement that the majority of users prefer to ride with others rather than alone. They stated a clear preference for use control (5% strongly prefer, 75% prefer, 2% neutral).

These answers give an initial indication that local area users are very socially interactive as had been expected after reviewing the literature, and seek out structured experiences but are not as clearly motivated in the sense of striving to succeed or compete as users examined in other research. Responses also suggest that the preferred ROS settings may be roaded natural for the physical setting, rural for the social setting, and rural for the managerial.

#### Play areas

Five questions deal with use in play areas. A moderate preference (45% prefer, 25% neutral) for play in open areas suggests that in this activity users like unstructured play. The same response was observed for hill climbing in preference to riding over low, rolling terrain.

#### TABLE TWO

# All Terrain Vehicle User Preference Interview Responses

	Strongly	Prefer	Neutral	Prefer	Strongly
(1) Would the majority of all terrain vehicle users you know prefer to ride on trails or in play areas.	0	15	2	3	0
(2) Would they prefer to ride for a challenge or to relax?	0	3	8	9	0
(3) Would they prefer to ride alone or with others in their group?	0	0	0	20	0
(4) Would they prefer to ride where users are controlled by the manager or are not controlled.	1	15	2	2	0
(5) If they were riding in a play area, would they prefer a large open area or an area with courses and runs?	0	9	5	6	0
(6) Would they prefer hill climbing or riding in low, rolling terrain?	0	9	5	6	0
(7) Would they prefer to be mixed with others they may not know or to be with just their own group?	3	6	2	9	0
(8) Do they look for competition with other riders or a challenge to themselves alone?	0	1	8	11	0
(9) Would they prefer play areas that are patrolled by the manager or are not patrolled?	1	13	4	2	0
(10) If they were riding on trails, would they prefer trails that separated riders by difficulty level or trails that mixed all users?	0	12	2	6	0
(11) Would they prefer trails which emphasize scenery or emphasize challenge?	0	12	5	3	0
(12) Trails through natural-appearing forest or through roaded, harvested forest?	0	10	7	3	0



TABLE TWO (Continued)

	Strongly	Prefer	Neutral	Prefer	Strongly
(13) Would they prefer multipurpose trails, that is, trails with challenges plus scenery, fishing, history, and so on, or single purpose trails for riding challenges only?	0	17	2	1	0
(14) Would they prefer competing with others or touring with others?	0	3	2	15	0
(15) Would they prefer trails without regulations on use or ones with regulations?	1	1	2	16	0
(16) Would they prefer trails that take a full day to ride or a half day?	0	1	2	17	0
(17) Would they prefer half day trail rides or one to two hour trail rides?	0	9	5	6	0
(18) One to two hour trail rides or shorter trails?	0	17	2	1	0
(19) Would they prefer fast or slow trails?	0	1	5	14	0
(20) Trails for speed or trails for maneuvering?	0	1	2	?	0
(21) Would they prefer narrow trails or dirt roads?	0	12	5	3	0
(22) Dirt roads or gravel roads?	0	17	0	3	0
(23) Trails for all terrain vehicles only or mixed with motorcyclists?	0	6	5	9	0
(24) all terrain vehicles only or mixed with hikers and horses?	3	9	0	8	0
(25) Would they prefer day use facilities or overnight facilities?	0	3	5	12	0
(26) Primitive campgrounds or ones with conveniences like water and garbage collections?	0	3	2	14	0
(27) Separate campgrounds for all terrain vehicle users or ones where all terrain vehicle users are mixed with the general public?	0	9	0	11	0

TABLE TWO (Continued)

	Strongly	Prefer	Neutral	Prefer	Strongly
(28) Free campgrounds or fee campgrounds?	0	3	0	17	0
(29) Picnic areas or staging areas?	0	6	5	9	0
(30) A loading ramp or none needed?	0	17	0	3	0
(31) Made to accommodate trailers or not?	0	20	0	0	0



While an even split was shown over the preference for mixing with strangers, 15% of those responding showed a strong preference for mixing with others. This seems inconsistent with the preference for riding to challenge oneself (50%) over competitive riding (5%) and suggests that racing may not be a likely problem in play areas: that high speeds may not in fact be desired but, instead, noncompetitive social contact or "cruising" may be. Peer pressure may be a useful tool for user compliance but this is unclear given the great preference for managerial control through patrols (5% strongly prefer, 65% prefer, 20% neutral).

### Trail riding

Respondents preferred by a two-to-one margin (10% neutral) to ride on trails which separate trail riders by difficulty level again indicating acceptance of a visible managerial presence.

Sixty percent of respondents preferred scenery over challenge, (25% neutral). The vast majority (85%) preferred multipurpose trails over challenge trails with only 5% opposing. Half preferred dense, natural forest over harvested units (35% neutral). These responses reaffirm the observations of Peine, Keir Nash, and others that off road vehicle users use their vehicles for a variety of reasons, any of which may dominate vehicle operation as the most preferred pastime. Users have also been observed by Peine and Keir Nash to take great pleasure from being in a natural setting. Even the challenge of the vehicle is influenced by the setting to the degree that the combination of the two represents a single, distinctive experience, a "striving in nature", in Keir Nash's words.

and also offers scenic views. They expect to be limited by regulation to travelling only on the trail and to travelling in a one-way loop in order to assure their safety and protect the scenery.

When asked about the acceptability of sharing trails with motorcyclists, respondents showed a 45% to 30% preference for sharing over single purpose vehicle trails. When asked about sharing trails with hikers and horses, they showed a 60% to 40% preference for vehicle only trails, with 15% preferring them strongly and none being neutral. One manager's observation was that this reflected strongly the actual choices of users, given an option, and that a minor segment of respondents would react differently, only because of the political expediency of doing so. A check of answers by respondents who were among the state user group leaders showed that they conformed to the observation, perhaps suggesting that a portion of the responses was made to perpetuate political images rather than to represent actual practices.

Travelling over dirt roads is not preferred (60% against, 25% neutral) nor is viewing harvest areas (50% against, 35% neutral), although both may be acceptable, perhaps depending on other trail related qualities. In this regard, all terrain vehicle users seem to prefer a natural appearing setting much as do other types of recreationists such as hikers and backpackers, another observation made by others (Peine; Fillmore and Bury).

Dirt roads were heavily preferred over gravel roads due primarily to the risk of being struck by stones thrown into the air by vehicle tires.

On the topic of base facilities, respondents showed a distinct preference for facilities with conveniences. They desired overnight facilities (60%) with



conveniences such as water and garbage collections (70%) and prefer to pay for added services (70%). They were split 45% to 55% on separate facilities for all terrain vehicle users as opposed to sharing with the general public. In this regard, many stated that they were not opposed to the general public but foresaw complaints from nonusers and had reservations about this situation.

They were likewise split on the need for picnic facilities versus staging facilities alone. Most stated a need for a loading ramp and room to accommodate all terrain vehicle trailers.

As stated previously, the primary benefit of the interview process was in the generation of additional discussion on both the central and satellite issues. Respondents offered many insights into user behavior, design elements, and management issues, many of which were not evident to the interviewer from a literature search alone. While opinions on the use of on-forest opportunities varied from no interest to substantial expectations, all persons interviewed showed a willingness to not only respond in the context given but to share the insights gained from their experiences. In this regard, the leaders in the all terrain vehicle community demonstrated, as do snowmobile users, a relatively great ability to function as an effective force in the political arena of land resource allocation.

#### Statewide and Area Use Trends

Use at the Oregon Dunes National Recreation Area was intensively examined using a cordon sampling method in 1977. Dunes personnel have since that time measured attendance with traffic meters and attributed use to various activities as it was apportioned in 1977. Because the all terrain vehicle phenomenon has been

recent, use estimates do not account for it as a segment separate from other off road vehicle uses. No good estimates on all terrain vehicle use trends exist. Managers observe, however, that all terrain vehicles have supplanted the dune buggy as the primary vehicle used in the Oregon Dunes. Dunes managers estimate that three to five all terrain vehicles exist today for each dune buggy used by a family in 1977. Calculations stated by the Oregon All Terrain Vehicle Association and supplied to the Oregon Dunes National Recreation Area (Stafford Owen, personal conversation) show that 47% of all in-state use occurs on the Dunes and 75% of all use occurs on the Siuslaw National Forest beachfront land (of which the Dunes is a part). The Siuslaw and Willamette National Forests are about equidistant from urban population centers of the Willamette Valley.

Nonsnow season all terrain vehicle use occurs in concentrations at three areas in the central Oregon Cascades located on the Willamette, Deschutes, and the Umpqua National Forests. While managers are analyzing use patterns and attempting to accomodate users, no estimates of all terrain vehicle use levels presently exist for these locations.

The Oregon State Motor Vehicle Division registers all terrain vehicles and maintains records on them by model year (see appendix). Prior to 1985 all terrain vehicles were identified in state records as motorcycles. They have only in the past two years been registered as all terrain vehicles and separated from motorcycles in state records. Their statistics show that registration of snowmobiles, motorcycles, and all terrain vehicles have all decreased in the past year statewide. New snowmobile registrations decreased only slightly in 1986 compared with 1985 while new all terrain vehicle registrations dropped by 22% and new motorcycle registrations decreased by 48%. No explanation is given for this decrease.



New all terrain vehicles numbered 5,056 statewide and 3,223 in the twelve county area within 60 air miles of Willamette National Forest portals. By comparison, combined new street legal and off road motorcycle registration stood at 3,365 for the state and 2,479 for the region. Registered 1985 motorcycles were equal in number to all terrain vehicles (6,565 to 6,522) and actually exceeded them in number in the region (5,228 to 4,041). In fact, the greatest number of currently registered motorcycles are 1981 and 1982 models. Registration records show decreasing numbers in 1983 and 1984 and have continued the downtrend except for a substantial increase in 1985. Registered all terrain vehicles have increased in number by 30-50% annually since 1981.

One inference which can be drawn from this information is the indication that actual use levels of participants in off road vehicle activities may not have increased as greatly as registration records indicate but may, instead, have resulted from changing use patterns from group travel in dune buggy-type vehicles to individual travel on all terrain vehicles.

Insufficient detail exists in statistical records to settle this question quantitatively. The conclusion remains, however, that the actual number of hours of vehicle operation has increased substantially due to all terrain vehicle use growth in the past five years.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

The majority of all terrain vehicle users in the service area, as viewed by their leaders, appear to have similar preferences and habits to off road vehicle users studied elsewhere. They are quite socially oriented, both within their own groups and with others not known to them. They are more interested in touring than in competing with others but enjoy the challenge offered by riding all terrain vehicles. They prefer trail riding over play area riding and riding on trails over dirt roads. They prefer viewing natural settings over harvested land but will accept trails in managed forests. They desire user controls such as regulations on trail use.

They prefer half day rides on trails open to motorcycles but closed to nonmechanized traffic. They prefer trails which segregate users by skill level. In base facilities they prefer conveniences and services rather than primitive facilities. In day use areas, no clear need for picnic facilities was stated but loading ramps and room for all terrain vehicle trailers are clearly needed.

User preferences appear to parallel Forest Service philosophy on the emphasis on noncompetitive, resource appreciative experiences.

Perceptions of those interviewed may reflect a bias toward preferences and expectations of users who tend to affiliate themselves with organized groups. The unaffiliated rider, who could be motivated by different preferences and expectations, makes up an unknown portion of the total user group. It is unknown how well this subpopulation is represented in the analysis.

Design of resources and facilities to provide the roaded natural class on the Recreation Opportunity Spectrum physical setting is appropriate. The rural class on the social and managerial settings is appropriate.

No definitive data were found which could be used to predict use trends for the forest setting. Off road vehicle use levels at the Oregon Dunes National Recreation Area are apparently stable. Dune buggy use, preferable in the late '70's, has been largely displaced by all terrain vehicle use and so, while recreation visitor days of use may be stable, the number of vehicles has increased from two to three times.

Sales of all terrain vehicles nationally, statewide, and within the service area (a 2 1/2 hour driving distance from Forest portals), have surged in the past few years according to industry representatives, local dealers, and users but no numerical trends can be established for the state. Registration for Oregon Counties shows that all terrain vehicle use is a more recent phenomenon than snowmobile and off road motorcycle use and may be either continuing to increase or may be plateauing at present. All terrain vehicles far outnumber snowmobiles and appear to exceed the number of off road motorcycles statewide and in the local region of the state.



Recent state legislation provides funds for all terrain vehicle facilities. It has produced a substantial amount of money which is available for investment on national forest land.

### Recommendations

1. Forest areas should be inventoried for their potential to provide nonsnow season all terrain use opportunities.

- Areas should be identified which allow for trails at least three miles in length for "easier" and 10 miles in length for "more difficult" classifications. Development should not occur unless adequate length and challenge can be assured. (See Forest Service Handbook 2350 for design standards.) Most difficult trails should not be developed until better use trends are established.

- Play area use should be provided only if use is clearly unlikely to be competitive and will be complementary to the appreciative use of the natural setting. Play area use should not be facilitated unless it can be confined to a defined area and resource maintenance can be assured.

2. If they are found to be appropriate, trails should be provided to which users can be confined, and which provide multiple opportunities, including such features as scenery, fishing, berry picking, hunting access, and alternative routes for exploration over varying terrain. Use regulation should be minimized to the extent possible. Alternative loop rides should be available in the

- Trail design should be used to control user interaction and prevent resource damage. One way trails should not be developed. Although they may be well accepted and even requested by the user, National Forest law enforcement patrols should be avoided.
- A high level of group interaction is permissible both on trails and in base facilities.
- Opportunities for combined all terrain vehicle and motorcycle use may prove difficult to provide without incurring resource damage from motorcyclists. Designs should be reviewed for adequacy as motorcycle trails to insure compatibility with the resource and between users.
- Trails should not be converted hiking trails but should be designed for all terrain vehicle use. Nonmotorized use is allowable but trails should clearly be identified as being open to motorized use.
- Base facilities should not include campgrounds until use trends justify campgrounds specifically for all terrain vehicle use. Picnic facilities are also not recommended at this time. Loading ramps and adequate room for all terrain vehicle trailers should be provided.
- Trails may be constructed in harvest areas but views should not be dominated by obviously modified scenes. Users prefer natural appearing scenes.
- Trails within 1 1/2 hours driving time of Salem and the Eugene-Springfield area should be provided. Design capacities cannot

be specified at this time; the amount of development should be limited until needs can be more clearly determined.

-- Trails should not be constructed for combined snow and nonsnow season use.

-- Development of any single area should be based on an approved management plan. Developers should explore utilizing funds from the State of Oregon all terrain vehicle fund for both development and maintenance.

#### Suggestions for Future Study

Additional research should be aimed at determining trail capacities and locations necessary to satisfy projected demands. More information is also needed to better establish use trends and user preferences. Further research should be aimed at direct sampling of users to determine preferences. More detailed facility designs (radius and grade of climbing turns, armoring specifications, etc.) are needed.



## APPENDIX

## ALL TERRAIN VEHICLE USER PREFERENCE INTERVIEW SCRIPT

I have some questions to ask you about all terrain vehicle use in the forests of the west side of the Cascade Mountains.

I will ask you to tell me the preferences of all terrain vehicle users you know for different activities and facilities. For example, would the majority of all terrain vehicle users you know prefer to ride on trails or in play areas? Your answer could be one of five answers: they strongly prefer trail riding, they prefer trail riding, they would be neutral about a choice between the two, they prefer riding in play areas, or they strongly prefer riding in play areas.

You may ask questions at any time and I invite your comments, but please try to save long discussions until we have finished the questions and answers.

Is that clear?

Okay, here we go.

- (1) Would the majority of all terrain vehicle users you know prefer to ride on trails or in play areas?
- (2) Would they prefer to ride for a challenge or to relax?
- (3) Would they prefer to ride alone or with others in their group?
- (4) Would they prefer to ride where users are controlled by the manager or are not controlled.

The next series of questions is about play areas.

- (5) If they were riding in a play area, would they prefer a large open area or an area with courses and runs?
- (6) Would they prefer hill climbing or riding in low, rolling terrain?
- (7) Would they prefer to be mixed with others they may not know or to be with just their own group?
- (8) Do they look for competition with other riders or a challenge to themselves alone?
- (9) Would they prefer play areas that are patrolled by the manager or are not patrolled?

These questions are about trails.

- (10) If they were riding on trails, would they prefer trails that separated riders by difficulty level or trails that mixed all users?
- (11) Would they prefer trails which emphasize scenery or emphasize challenge?
- (12) Trails through natural-appearing forest or through roaded, harvested forest?

- (13) Would they prefer multipurpose trails, that is, trails with challenges plus scenery, fishing, history, and so on, or single purpose trails for riding challenges only?
- (14) Would they prefer competing with a others or touring with others?
- (15) Would they prefer trails without regulations on use or ones with regulations?
- (16) Would they prefer trails that take a full day to ride or a half day?
- (17) Would they prefer half day trail rides or one to two hour trail rides?
- (18) One to two hour trail rides or shorter trails?
- (19) Would they prefer fast or slow trails?
- (20) Trails for speed or trails for maneuvering?
- (21) Would they prefer narrow trails or dirt roads?
- (22) Dirt roads or gravel roads?
- (23) Trails for all terrain vehicles only or mixed with motorcyclists?
- (24) all terrain vehicles only or mixed with hikers and horses?

This series of questions is on facilities.

- (25) Would they prefer day use facilities or overnight facilities?
- (26) Primitive campgrounds or ones with conveniences like water and garbage collections?
- (27) Separate campgrounds for all terrain vehicle users or ones where all terrain vehicle users are mixed with the general public?
- (28) Free campgrounds or fee campgrounds?
- (29) Picnic areas or staging areas?
- (30) A loading ramp or none needed?
- (31) Made to accommodate trailers or not?

Those are my questions, now do you have any comments?

I appreciate your help. Can you suggest the names of others who could help provide answers for this study?



All Terrain Vehicle User Preference Interview  
Record Sheet

Name \_\_\_\_\_ Date \_\_\_\_\_

	S	P	N	P	S	Comments
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Additional Comments

TABLE THREE

1986 Registered Motorcycles by Model Year  
(1978-1986)

COUNTY	1986	1985	1984	1983	1982	1981	1980	1979	1978
Lane	302	619	549	538	731	779	867	591	593
Linn	76	175	150	152	250	250	261	183	195
Marion	225	438	273	415	645	596	537	351	382
Benton	98	150	124	143	197	220	178	123	108
Polk	39	78	54	104	133	131	117	100	70
Yamhill	123	132	107	134	172	177	170	114	109
Washington	439	827	452	686	939	773	683	433	465
Multnomah	748	1896	852	1008	1875	1566	1224	820	892
Clackamas	333	754	410	624	884	768	634	403	466
Crook	8	25	23	33	33	37	33	34	39
Jefferson	11	18	21	16	31	41	36	23	30
Deschutes	77	116	143	195	213	265	214	143	172
TOTALS:									
REGION	2479	5228	3158	4048	6103	5603	4954	3318	3521
STATE	3365	6565	4450	6080	8656	8183	7281	5107	5365

Source: Oregon Motor Vehicle Division

TABLE FOUR

1986 Registered Snowmobiles by Model Year  
(1978-1980)

COUNTY	1986	1985	1984	1983	1982	1981	1980	1979	1978
Lane	55	97	51	33	19	20	88	48	40
Linn	28	27	17	20	6	8	28	20	11
Marion	68	65	39	20	6	32	67	30	17
Benton	8	13	5	6	4	2	11	9	4
Polk	12	7	3	4	1	10	15	8	3
Yamhill	7	6	5	1	0	3	7	5	0
Washington	22	26	21	9	12	25	27	12	8
Multnomah	49	34	29	19	17	27	49	36	15
Clackamas	49	56	38	30	17	18	51	33	19
Crook	27	26	5	7	8	8	25	11	4
Jefferson	2	4	4	5	3	1	4	2	4
Deschutes	89	64	61	39	15	37	94	72	48
TOTALS:									
REGION	416	425	278	193	108	191	466	286	173
STATE	889	908	605	427	285	468	1036	637	438

Source: Oregon Motor Vehicle Division



TABLE FIVE

1986 Registered All Terrain Vehicles by Model Year  
(1978-1980)

COUNTY	1986	1985	1984	1983	1982	1981	1980	1979	1978
Lane	505	758	666	440	222	94	128	87	51
Linn	264	408	298	164	86	36	46	24	15
Marion	406	636	367	243	119	107	47	30	35
Benton	131	93	73	53	29	13	17	14	10
Polk	105	94	86	38	23	21	5	7	5
Yamhill	187	214	116	79	43	34	27	12	16
Washington	421	459	222	151	92	61	28	21	16
Multnomah	428	540	272	180	75	45	21	25	21
Clackamas	437	546	262	148	76	43	21	25	13
Crook	86	67	40	26	17	9	2	5	2
Jefferson	57	37	17	11	6	4	3	3	9
Deschutes	196	162	128	69	17	16	19	7	9
TOTALS:									
REGION	3223	4014	2547	1602	805	483	364	260	202
STATE	5856	6522	4173	2652	1260	766	538	416	309

Source: Oregon Division of Motor Vehicles

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